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X-PS3513
.E86 #

Inventing—
AS A BUSINESS

A PLAN TO SAFEGUARD INVENTORS

By

HUGO GERNSBACK

99 Hudson Street New York, N. Y.

Copyright 1933 by Hugo Gernsback, New York

BIZARRE
X-PS351
.E36
New Year
Issue
1945

MOON-RADIO EXACTLY PREDICTED IN 1927

...10, 1946 will be known as a red-letter day in radio ...n that date Lieutenant-Colonel John H. DeWitt and scientists of the U. S. Signal Corps first established ...act with the moon. Radio pulses from a Radar trans- ...Belmar, New Jersey, transmitted the signals, which were ...back from the moon in 2.4 seconds.

...s before, in his former publication RADIO NEWS, ...rnsback accurately predicted not only the idea itself, but foretold the frequency (wave length) that would have to be used for a successful accomplishment of the feat. Moreover, he also predicted the almost exact time of transmission and reception of the signal. He erred by 1/10 of one second.

His predicted time in 1927 was 2½ seconds — actual time of observed signals in 1946 at Belmar, New Jersey, was 2.4 seconds.

His predicted frequency was 2 meters (150 megacycles); actual frequency used was 2.68 meters (111.6 megacycles).

In 1927 there was no existing proof that a wave length around 2 meters could pierce the earth's heaviside layer, then travel on hundreds of thousands miles through space.

Events of 1946 proved the accuracy of the theory.

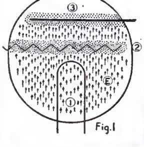
The photographic reprint of Gernsback's 1927 article speaks for itself.

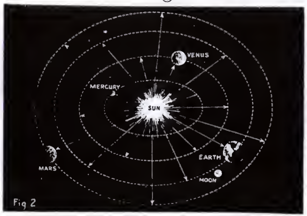
RADIO-CRAFT MAGAZINE
25 West Broadway 7, N. Y.

5 - MAR 29 ...-1946
X-PS3513
.E86 #3

Can We Radio the Planets?

By HUGO GERNSBACK
MEMBER AMERICAN PHYSICAL SOCIETY





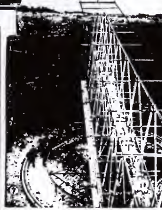


Fig. 1 shows the interior of a vacuum tube where (1) is the filament. E is the stream of electrons going in the direction of the arrows. (2) is the grid. (3) is the plate. The small dots surrounding the grid and plate indicate a layer of gas always adhering to metals, which the electrons must pierce. This shows, therefore, a miniature Heaviside layer. Fig. 2 shows a "celestial" vacuum tube, in which the sun gives off the electronic stream in the direction of the arrows. The various planets may be taken respectively as plates and grids in a multi-element tube; while the atmospheres of the planets are analogous to the gas adhering to the plate and grid, as shown in Fig. 1. Figs. 6 and 7 are two views of the Marconi Beam Transmitter, located at South Foreland, near Dover, England. It revolves, transmitting a radio signal over a very small angle at one time, and is in use as a radio "lighthouse," aiding navigation.

Fig. 3 shows how, by means of a powerful beam transmitter, located at some point "A" on our globe, we can send a beam of radio waves to the moon, which, being more or less metallic, will reflect the beam at the same angle. An observer, located at "B" on the opposite side of the earth, will receive the signal back from the moon, a distance of 238,000 miles, in two and a half seconds after it leaves the transmitter "A." Fig. 4 shows a radio beam-transmitter "A" at some point on the globe, transmitting a beam to "B" or "C." As the angle of the beam is varied, the respective observers will get the signal either strongly or not at all. By this system it will be possible to explore the interior of the earth, to ascertain how large is the earth's iron core. It is assumed that the radio beam will travel through the crust of the earth readily, while not at all through the solid iron core. Fig. 5 is another view of the Marconi revolving beam transmitter.

WHEN Jan Lippershey built his first telescope in 1608, he came in for severe condemnation, because it was argued that such an instrument of the devil could never do any good. When our own Percival Lowell first propounded his theory of the Martian canals and Mars as the abode of life, he, too, was greatly ridiculed as a visionary; and even today orthodox astronomers do not share his views. When the first telescope was built, the then *intelligentsia* could not see any good in it, except as an instrument of the devil; so when I ask the question, "Can we radio the planets?" I know that ... be subjected to not a little ridicule...

The telescope and spectrum ... opened the heavens to us to ... extent, and enriched our scienti... immeasurably. Spectrum analysis has shown ...

identical matter, with little possibility of exception.

As you will see further on, when I pro...

> "CAN We Radio the Planets?" does not necessarily mean that the author has attempted in this article to design apparatus to transmit and receive intelligence to and from other worlds, although such a possibility is discussed.
>
> Rather the author brings forth an entirely new point, where it is seriously suggested—by means of the beam system—to send and receive back the same beam, for scientific research work, as well as explore our own planet for scientific purposes, by means of the gigantic radio power station ...

or Venus, or to the moon, with the expectation of getting an answer—although the latter may not be as impossible in a hundred years as it is now. I am simply trying to show that, by making a start, an untold wealth of knowledge may be opened up to us; and that, the sooner we make the start, the greater the art of radio and our knowledge thereof will become.

The largest telescopes have been made possible through the generosity of our wealthy people, and it is, therefore, not impossible to hope that what has been done in building telescopes can be duplicated in building super-power stations for radio for research purposes. I might say, right here, that the benefits derived from such a super-power radio station will no doubt be vastly greater than from building a telescope, and for the following reasons:

but also for tremendously important radio research work between points on our own planet.

PENETRATING SHORT WAVES

I am fully aware of the criticism that will at once be raised, that it is not possible for us to send a radio beam beyond the confines of our own atmosphere, due to the so-called Heaviside effect, which is supposed to exist a hundred or so miles above the surface of the earth. According to the researches of the eminent scientist, Oliver Heaviside, the upper layers of our atmosphere are supposed to be so conductive electrically, due to the *ionizing* effect existing at such heights, that the radio waves are reflected; and it would thus seem impossible that we could shoot a radio beam outside of the confines of the earth.

This ... be perfectly true when it comes to ... radio waves, such as have been us... past, varying from some 15 ...5,000 meters; although I main-tain, ... with many other physicists, that the Heaviside effect has never been proven conclusively. I am equally certain that at an electromagnetic activity, the same as light waves or heat waves. It is believed that, the lower down we go in the wavelength scale (that is, the higher the frequency), the easier it becomes to penetrate the Heaviside layer, if we grant its existence at all. Light comes to us from the sun and the planets, through the Heaviside layer, so we know that the Heaviside layer cannot stop light waves. To be sure, the frequency of light waves is enormously higher than that of even the shortest radio waves, but it still seems reasonable that for waves of the length of two meters or even less, the Heaviside layer should not cause us undue worry.

Incidentally, interplanetary conditions are about the same as we find in our present vacuum tubes. Fig. 1 shows a vacuum tube, in which (1) is the filament, (2) the grid, (3) the plate. Electrons are given out by the filament (1), and shoot in the direction of (3); but, surrounding the grid and the plate, there is a miniature Heaviside layer, composed of a slight amount of gas, which surrounds all metallic and other matter, and which the electrons must first pierce before electrons, this internal tube "Heaviside layer" can be broken down as is well known. Conditions on earth seem to be similar. If we employ the right radio wave, with sufficient power behind it, it should be possible to pierce the supposed Heaviside layer and shoot the waves out into free space. In this we would be assisted by the force of the solar radiation itself. This is made plain in Fig. 2, which shows that our own planetary system is nothing but a vacuum-tube arrangement on a large scale. We have the sun in the center, with the planets outside, which in this case become the plate and grid of our celestial vacuum tube.

It will be noted that the solar radiation is in the direction of the arrows. It would seem, therefore, that a beam of the correct radio wave sent, let us say, from the earth to Mars, when in "conjunction," would stand a better chance of being tra... than *vice versa*. For that reason, ... that a supposed signal emanati... earthward would find it neces... work against the stream of solar emana... and encounter more resistance than if the case

CHRISTMAS 1946 25¢

Digest of Digests

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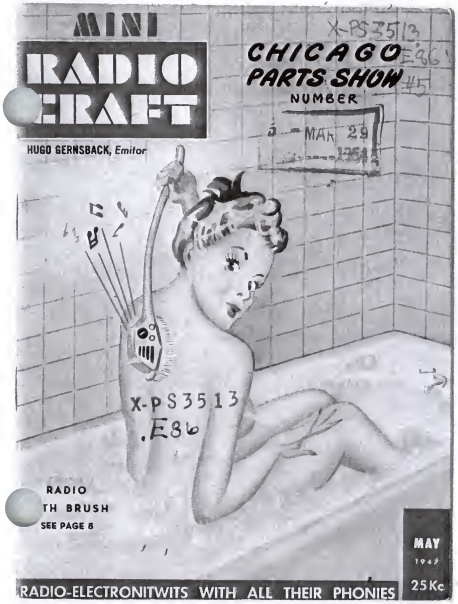

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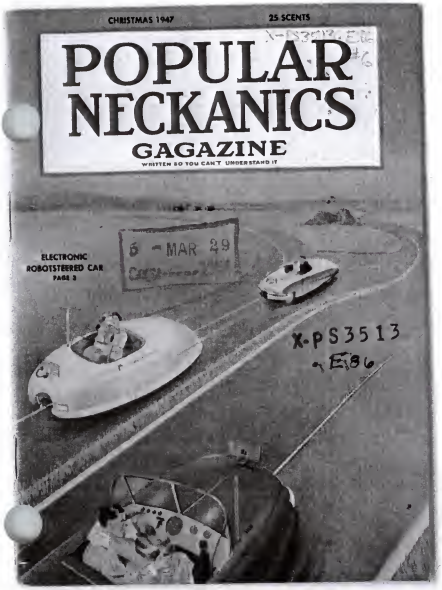
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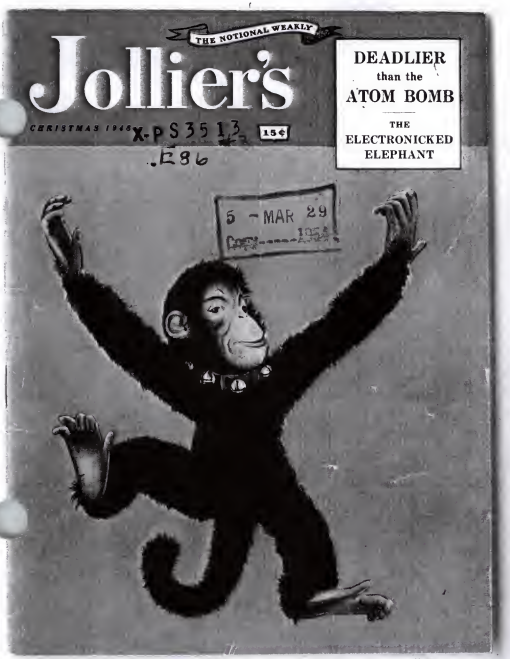

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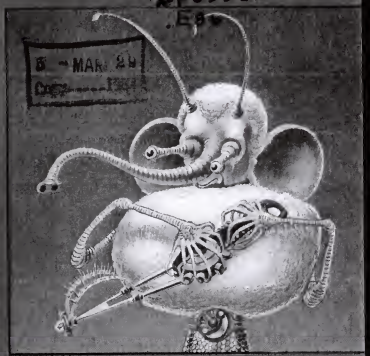

SPECIAL MARS NUMBER

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DECEMBER 25, 1966 20$

The Submarauder

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DOCUMENTATION
Of The
LEARN-WHILE-YOU-SLEEP METHOD

By HUGO GERNSBACK

THE Learn-while-you-sleep method of instruction has lately been described in a number of publications. Imparting knowledge to the sleeping individual has the following advantages:

1. The period while we are asleep is usually wasted, when it could be used to impart useful knowledge to the subconscious mentality.

2. Many individuals cannot master certain subjects while awake, whereas it has been proved by actual experience that they can master them while soundly asleep, for instance learning the telegraphic code.

Recently a number of individuals have been given credit in various magazine articles as having originated the learn-while-you-sleep method. It is for this reason that the writer has found it necessary to publish the present detailed documentation.

As will be observed from the photographic reproductions in this presentation, the writer originated the learn-while-you-sleep method in 1911.

It was first described in detail in the writer's magazine MODERN ELECTRICS monthly in his science fiction novel RALPH 124C 41+. This novel was serialized in MODERN ELECTRICS, the first radio magazine in the world. The installment containing the *Hypnobioscope* (the learn-while-you-sleep instrumentality) appeared in the June, 1911, issue. (Circulation at that time near 100,000.)

A second article giving further details on the learn-while-you-sleep method appeared in SCIENCE AND INVENTION magazine, December, 1921, issue, under the title "Work and Learn While You Sleep." (Circulation at that time 200,000 copies.)

A third article describing how the writer's original learn-while-you-sleep theory was first put into practice ran in RADIO NEWS magazine for October, 1923, under the title "Learn While You Sleep." (Circulation at that time 400,000 copies.) In this article, Chief Radioman J. N. Phinney, U. S. Navy, relates his actual work with the method, at the Navy Training School at Pensacola, Florida, in 1922. Here students were successfully taught Continental Code while they slept. (See page 7.)

In recent years a number of magazines—all with large national circulation—published articles on the learn-while-you-sleep method giving the writer credit as the originator of the method:

1. TIME magazine, for January 3, 1944, published an article about the writer in which the Hypnobioscope and the subconscious learn-while-you-sleep method were described.

2. CORONET magazine in July, 1944, printed an article by the well-known writer Howard Whitman who discussed the learn-while-you-sleep method in an account devoted to the writer's work.

3. MAGAZINE DIGEST for January, 1948. A further article discussing the Hypnobioscope, learn-while-you-sleep idea appeared in this magazine.

In addition to this, the method has been described throughout the years in various languages in many scientific magazines.

Some recent writers who should know better, have quoted Aldous Huxley, in his novel BRAVE NEW WORLD, as the originator of the idea. This claim is preposterous for the simple reason that Huxley's novel did not appear until 1932—*21 years after the writer published his original method.*

A number of imitators are now using the earphone method which the writer originally described in SCIENCE AND INVENTION, December, 1921. This arrangement is completely obsolete in the writer's opinion because you cannot wear earphones and sleep comfortably with them. The method of using an earphone on top or in the bed pillow is inefficient, because it leaves one ear open, infiltrating distracting outside noises. This confuses the subconscious and makes it impossible to get the most efficient retentivity of the directed sounds.

The writer has pointed this out to a number of people who have used his method either commercially or for research purposes.

Throughout the years the writer's method has been greatly improved and *a mass-use method of the learn-while-you-sleep idea will come into use shortly. In the writer's new development no ear or headphones are used.*

At present this newer method is in the final development stage and until it is introduced to the public, no details can be given.

It should furthermore be noted—for the record—that the so-called brain wave patterns which are often pointed out in connection with the learn-while-you-sleep method, were also predicted by the writer at length in his imaginary *Menograph* in 1911, published in his novel RALPH 124C 41+ (see page 4).

Dr. Hollowell Davis, of Harvard Medical School, first demonstrated the brain thought waves in 1935, exactly as the writer had conceived them 25 years before.

RADIO - ELECTRONICS

25 WEST BROADWAY
NEW YORK 7, N. Y.

R. A. Fallath, PUBLICITY
Rector 2-8630

X-R53513.E86 #13

NEWS RELEASE

FOR RELEASE DECEMBER 21, 1951

The bride and groom of tomorrow will walk down the aisle knowing exactly how much chance their marriage has of succeeding for they will have taken and passed an electronic compatibility test. When they drive off on their honeymoon — they will ride secure in the knowledge that their car has been collision-proofed by electronics.

When, at last, they settle down in their own, little, dust and noise-free love nest, it will be equipped with a 3-dimensional, full color "telebiovision" set which will relay not only sight and sound but odors, tastes and sensations.

So says Hugo Gernsback, publisher of RADIO-ELECTRONICS magazine and Number 1 Science Prophet, in his annual Christmas greeting "Forecast 1952". Gernsback has been sending these unique greetings since the early '30s.

In "Forecast 1952", he predicts, in addition to the devices mentioned, such scientific strides forward as telecasting the sun's awesome corona from outer space, airplane shelterways, thermo furniture, multiple TV sets and sleep conditioners.

The uninitiated may arch an eyebrow at Hugo Gernsback's "outlandish" forecasts, but those who know his remarkable record for deadly accurate scientific prophecy, will take a more serious view. In his book, "Ralph 124C 41+", written in 1911, he foretold - in accurate detail - television, radar, blood transfusions, radio communication with the moon and many, many, other achievements — called ridiculous in 1911, but fact today.

Mr. Gernsback, partially explains his remarkable penchant for accurate prophecy by pointing out that his predictions are not wild flights of fancy, but the logical and natural projections of established scientific facts.

# # #

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CHRISTMAS 1951

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Address Read Before
10th WORLD SCIENCE FICTION CONVENTION
CHICAGO AUGUST 30 - 1952

5 - MAR 29

For Release
August 31

THE IMPACT OF SCIENCE FICTION ON WORLD PROGRESS

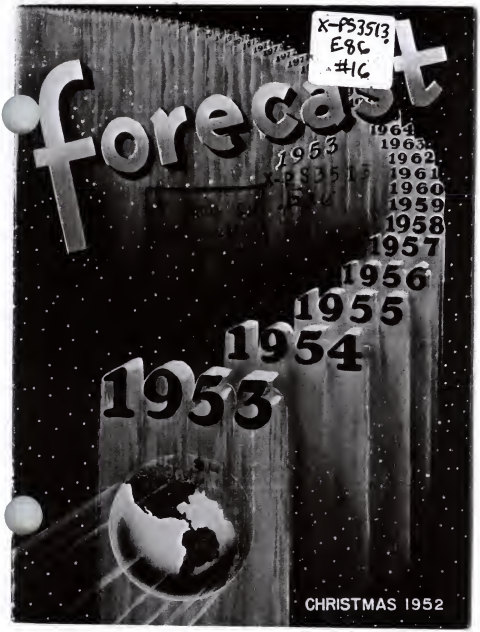
By Hugo Gernsback

An imperceptible revolution has quietly taken place during the past 25 years---a revolution probably unparalleled in man's history. The revolution is the terrific impact of Science Fiction on the world and world progress. Curiously enough, the agency responsible for Science Fiction--the authors, the publishers, and the readers, seem little aware of this revolution and the real meaning and import of the dynamic force that carries it forward.

Let me clarify the term Science Fiction. When I speak of Science Fiction I mean the truly, scientific, prophetic Science Fiction with the full accent on SCIENCE. I emphatically do not mean the fairy tale brand, the weird or fantastic type of what mistakenly masquerades under the name of Science Fiction today. I find no fault with fairy tales, weird and fantastic stories. Some of them are excellent for their entertainment value, as amply proved by Edgar Allen Poe, but when they are advertised as Science Fiction, then I must firmly protest.

Twenty-five years ago, before Science Fiction had become an organized and recognized force---the broad smoothly-flowing literary river it is today---we had but a weak trickle of occasional stories and here and there a book or two. It was a rarity when an author wrote more than one or two Science Fiction stories. Rarer yet were a series of Science Fiction books, such as those of the masters Jules Verne and H. G. Wells.

The truth is that in the early, formative years Science Fiction was hardly considered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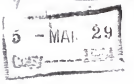

Testimonial

X-PS3513
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to

HUGO GERNSBACK

"Father of Science-Fiction"

1903 — 1953

X-PS3513
.E86 #19

His Pipe Dreams Are Tomorrow's Inventions

D - MAR 29
Copyright 1954

by

ERIC HUTTON

Reprinted from

MAGAZINE DIGEST

TORONTO, ONTARIO

X-PS3513 .E86 #20

A REPRINT FROM JULY 1944 CORONET

A glimpse into the incubator of Science which will probably cause you to lean back and gasp, "My gosh, little man! What next?"

5 - MAR 29
Copy 1961

Truth Catches Up with His Fiction

by HOWARD WHITMAN

X-PS3513
.E86

A BRITISH newspaper once called Hugo Gernsback the greatest living prophet. Right to that title was earned by Gernsback in showing the world long in advance the forms of such modern realities as radio loudspeakers, chain broadcasting, television, radar, rocket planes and robot tanks.

The modern Leonardo da Vinci is an inventor and publisher. He communes with the future in an old-fashioned downtown office in New York near the Woolworth Building. Among his 80 inventions are the "osophone,"—to enable deaf persons to hear through their teeth, and the "hypnobioscope," a device by which people may absorb education while they sleep. This may develop to be the complete answer to children's school homework worries, he says.

At 59, Gernsback says of himself, "I am a fountain of ideas, with neither the time nor the patience to translate them into money. People of my type are never good businessmen."

In 36 years of publishing, Gernsback has founded some two dozen publications, most of them in the science field, with occasional diversions into other lines, such as sex and beauty. In 1911, when he was publishing a little magazine called *Modern Electrics*, he wrote the first of the scientific chiller-thriller serials, a story called "Ralph 124C 41+," a forerunner of the popular "science fiction."

Gernsback called the yarn "A Romance of the Year 2660" and packed it with such visions as interplanetary communications, space flyers, a futuristic battle between an earthly lover and a Martian rival, potent rays of many types, a gadget to produce invisibility, and other grist which the "science fiction" mills of today still are grinding upon.

The title was a pun— Ralph One to fore-see. Get it? It's pretty bad. The 41+ was Ralph's serial number, used instead of a name in the year 2660. But in the scientific predictions Gernsback showed his looking-toward-the-future stuff.

Ralph was a great scientist on earth in the 27th century. The story starts off when through the

5 - MAR 29
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RADAR in 1911

The controversial question: "Who first used radar?" has never been answered to everyone's satisfaction.. However the question: "Who first suggested its technical use?" is easier to solve.

In view of the fact that the government now has lifted all restrictions on radar, it will come as a surprise to many that the first authentic technical record of radar appeared in November 1911. *The article was printed in the December* 1911 *issue of* Modern Electrics *as shown on the right. It will be seen that all of the present radar conceptions were embodied in this, the first authentic technical record of radar. Note particularly the words* "pulsating . . . wave"— *here first used. Radar cannot operate without pulsating waves.*

In a letter dated December 20, 1944 *to Hugo Gernsback, Dr. Lee De Forest, father of radio, and inventor of the vacuum tube said as follows:*

"Your fanciful suggestion as far back as 1911 *should certainly have suggested to a later investigator of ultra-high frequency radio beams the possibility of using that principle as radar has now been used, for the detection of hostile airplanes. The chances are, however, that no investigator of UHF (Ultra High Frequency) radiations in the* 1930's *had ever read what you wrote in* 1911. *You may, however, take justifiable pride in the farsightedness of many of your startling suggestions."*

The title of the article is a mythical character living in the year 2000. *The article was one of a series of pseudo scientific speculations, nevertheless it is as technically sound as though written today by a serious radar engineer.*

Radio-Craft

The first authentic technical record of RADAR to appear in print.

Reprinted from Modern Electrics, Vol. 4, No. 9, page 593, December 1911 issue.

VOL. IV. DECEMBER, 1911. No. 9.

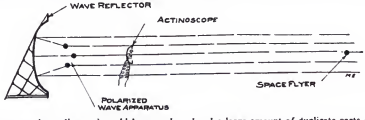
Ralph 124C 41 +

(Continued.)

By H. Gernsback.

At first thought it might be considered a difficult feat accuratcly to locate a machine thousands of miles distant from the earth, speeding in an unknown direction somewhere in the bottomless universe. The feat, while remarkable, is easy to accomplish by any up-to-date scientist. As far back as the year 1800 astronomers accurately measured the distance between the earth and small celestial bodies, but it was not until the year 2659 that the famous scientist 124C 41 succeeded in accurately determining the location and distance of space flyers, far out in space, where not even the most powerful telescope could follow any more.

It has long been known that a *pulsating polarized ether wave*, if directed on a metal object, could be reflected in the same fashion as a light ray can be reflected from a bright surface or from a mirror. Moreover, the reflection factor varies with different metals Thus the reflection factor from silver is 1,000 units, the reflection from iron 645, alomagnesium 460, etc. If, therefore, a polarized wave generator were trained towards the open space, the waves would take a direction as shown in diagram, providing the parabolic wave reflector was used as shown. By manipulating the entire apparatus like a searchlight, waves would be sent over a large area. Sooner or later, if the search is kept up, these waves must come in the direction of a space flyer. Then a small part of the waves would strike the metal body of the flyer, and these waves would be reflected back to the sending aoparatus. Here they would fall on the



Actinoscope (see diagram), which records only the reflected waves, not the direct ones.

From the actinoscope the reflection factor is then determined, which accurately shows from which metal the reflection comes. From the intensity and the elapsed time of the reflected impulses, the distance between the earth and the flyer is then accurately calculated with but little trouble.

The reflection factor of magnelium (the metal of which Fernand 60O 10's machine was constructed) being 1060, Ralph located his rival's space flyer in less than five hours' search. He found that 6OO 10's machine at that time was about 400,000 miles distant from the earth and that the abductor of his 'sweetheart apparently was headed in the direction of the planet Venus. A few seconds' calculation showed that he was flying at the rate of about 45,000 miles per hour. This was a great surprise for Ralph and it delighted him at first. He knew that 6OO 10's machine was capable of making at least 75,000 miles an hour. This was certainly as strange as it was puzzling Ralph reasoned that if he were in his rival's place, he certainly would speed up the flyer to the utmost. Why then was 6OO 10 flying so leisurely? Did he think himself secure? Did he think that nobody could or would follow? Or did he have trouble with the *Anti-Gravitator?* Ralph could not understand it. However, his mind had already been made up. He would of course chase his rival, head him off, and, if necessary,—yes, he would kill him.

He gave sharp and quick orders to his attendants and ordered his space flyer, the "Cassiopeia," to be made ready within one hour. Provisions sufficient to last for six months were put on board and Ralph himself brought a large number of scientific instruments to the flyer, many of which he calculated might turn out to be useful. He also ordered a large amount of duplicate parts of the flyer's machinery to be put on board in case of emergency, and he then bade farewell to his family.

Although this was, of course, not the first time he journeyed into space, the members of his immediate family were greatly concerned,

(Note.—This Novel started in the April Number Back issues containing all instalments will be furnished at 10c each)

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ATOMIC GUN IN 1915

A precise preview of World War II and the effects of the atomic bomb accurately predicted in 1915—30 years ago, by the Editor of THE ELECTRICAL EXPERIMENTER, now Editor of RADIO-ELECTRONICS

... "A machine which at one stroke can annihilate several Army Corps" ... to end all wars.

... "Setting off spontaneously the dormant energy of the atom ... concrete, steel, men and guns ... gone completely. Only a dense cloud of vapor hanging in the air remains" ...

... "A city of 300,000 souls (note that Hiroshima had 320,000) ... houses, churches, bridges, parks ... gone up in a titanic vapor cloud; only a vast crater in the ground where the thriving city once stood remains" ...

... "After this demonstration the enemy sues for peace; resistance would be folly. The country is conquered."

RADIO-ELECTRONICS MAGAZINE
25 West Broadway, N. Y.

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Warfare of the Future

By Hugo Gernsback

THE European War has clearly demonstrated what a tremendous part modern science plays in the offense as well as in the defense of the contending armies. It has often been said during the past twelve months that this is not a war so much of men as of machines. Nothing could be truer. In fact, it might be said that this is a war of infernal machines against more diabolical machines.

It has been stated editorially in this journal that there will be war always, or at least till we arrive at a period when some scientific genius (or shall be call him devil?) invents a machine which at one stroke is capable of annihilating one or several army corps. When that time arrives, soldiers, no matter how courageous, will think a long time before they will offer themselves to be slaughtered by the hundred thousand.

In the meantime, probably for many generations to come, the war death-dance will go on without any doubt whatsoever. Humanity simply has not advanced to such a state where disarmament is possible. Our real civilization only dates back less than 100 years, and as human progress is extremely slow, it may take a thousand years and more before humans will learn how to trust each other implicitly. As long as we require policemen and jails to keep us out of mischief, we are not able to take care of ourselves and we cannot call ourselves emancipated—we are still held in bondage by the brute in ourselves, which threatens to break out at any opportune moment, as is witnessed in the present war:

Therefore, the pacificists, particularly those in our country who think that this is the "last war" and who go around shouting peace at any price, are not only a sorry lot, but they are cheerfully oblivious of the teachings of history as well as of human evolution.

These good people would shout murder if you dared suggest to them to dismiss at once all policemen and patrolmen of their home town, but they would trust a strange nation implicitly from making war on this country, simply because that nation pledged itself on a piece of paper not to make war!

If the present war is ghastly with its poison shells, its deadly chlorine gas, its bomb-throwing aeroplanes, its fire-spraying guns, its murderous machine guns, etc., what can we expect of the wars of the future?

What will happen when the scientists of a hundred years hence begin making war on each other?

Suppose that by that time our scientists have solved the puzzle of the atom and have succeeded in liberating its prodigous forces. Imagine that at that time one atom can be disintegrated at will, instantly into another, what will happen? The results will simply be overwhelmingly astounding and almost incomprehensible to our present minds.

It has been calculated that if we could liberate the latent energy at present locked up in a *copper one cent piece* we would be enabled to propel a train with 50 freight ... will you make yourself the first Master of this Planet?"

The War Lord promptly asks for a secret demonstration of the new *"Atomic Gun,"* and what he sees intoxicates his imagination to such a degree that he decides to make war on the entire world as soon as his generals have assured him that enough atomic guns have been manufactured to make success certain. And one beautiful spring morning our War Lord finds a perfectly logical pretext to make war on a few nations, and the latest war dance is on.

Within a few hours the first atomic gun, popularly known as the *"Radium Destroyer,"* has crossed the enemy's frontier

The Radium Destroyer is mounted on fast moving auto trucks and is controlled entirely by Radio energy. No man is within a mile of the Destroyer—it is too dangerous to be near it when in action. A young lieutenant with phones clapped over his head and who follows the Destroyer in the *"Control Auto,"* and who gets his own orders from the General Staff by Wireless, guides each and every motion of the distant Radium Destroyer simply by moving certain keys and switches in front of him.

Soon his Destroyer has arrived in front of the enemy's first line of concreted steel trenches, protecting the land behind them. In front of the trenches the ground has been purposely cut up to impede the progress of ordinary vehicles. The General Staff, of course, knew this, and built the Destroyer accordingly Our friend the lieutenant stops the Destroyer's truck and moves a lever. Immediately the Destroyer hops from the truck and begins to jump with amazing speed over the cut-up ground, in grasshopper fashion. A few hundred feet from the well-concealed concrete trenches the Destroyer is made to halt. Our lieutenant moves a few switches, turns a knob and presses a key—then lo! the inferno begins.

A solid green *"Radium-K"* emanation ray bursts from the top of the Destroyer and hits the concreted steel trench. Our front cover gives but a faint idea of what happens. The Radium-K emanation has the property of setting off spontaneously the dormant energy of the Atom of any element it encounters except lead. So when the ray hits the trench it went up in dust, concrete, steel, men and guns behind it, everything. After spraying the trench lengthwise for a few minutes it is gone completely. Only a dense cloud of vapor hanging in the air remains.

The fleet of Radium Destroyers now enters through the gap, destroying everything in their path. No gun can hit the Radium Destroyer for ere the gun can get the proper range, the Radium-K Ray has hit the gun or the ground below it and has sent it up in vapor, including the men behind it. As a demonstration, the Commanding General asks that the first town encountered, a city of 300,000 souls, be vacated within three hours. The terrorized inhabitants are forced to comply with the request, whereupon a dozen Destroyers line up on the hills and spray the unlucky ... night the War Lord has conquered the entire world and has proclaimed himself as the First Planet Emperor.

What happens afterwards when the secret of the Radium Destroyer is discovered by the War Lord's enemies is another chapter, so we will desist!

The above may read very fantastical and extremely fanciful. It is, however, not only very possible but highly probable.

Modern Science knows not the word Impossible.

ANENT WARLIKE INVENTIONS.

It is one of the anomalies of warfare that the machinery for fighting and killing has been brought to its present ghastly perfection not by swashbuckling, bloodthirsty soldiers, but by the mild-mannered, peace-loving civilians, says the *Review of Reviews*. True, both army and navy officers have exercised their ingenuity to heighten the terrors of battle, but theirs are rather academic improvements on the more daring contrivances of civilian mechanics and engineers.

Who gave us the turreted ironclad? Not a naval officer, but Ericson, a marine engineer. Who invented the machine gun, which squirts death every day on a dozen European battlegrounds? Not a colonel or a captain, but Hiram Maxim, a brilliant American mechanic. Who gave the battleship its quick-acting gun-elevating mechanism? Not an ensign or a commodore, but Janney, an American mechanical engineer. Who invented the motors for turning turrets rapidly? Not a lieutenant, but H Ward Leonard, one of Edison's former assistants. Who planned the submarine? Not a Hull or a Nelson, but Robert Fulton, an artist.

So, one after another, the really important, the really epoch-making inventions comprising the mechanism of warfare prove to be the conceptions of romantically imaginative but lamb-like private citizens Usually their contrivances are anything but perfect. They must be developed, and it is in their development that the professional soldier has been most serviceable.

It is thus not only with the guns and submarines of war, but also with the telephones and electric lights of peace; for the inventions that have made the United States and other countries commercially great came not from within given industries, but from without.

Always it is a dreamy pioneer, an intrepid free-lance, aflame with enthusiasm, who enriches his country with a radically new labor-saving device or way of utilizing energy. Morse was a portrait painter when he first turned his attention to the telegraph; Bell was a teacher of deaf mutes when he began his experiments with the telephone; Edison was a patentee of telegraphs and phonographs when he gave us the incandescent lamp; Marconi was a mere lad with a liking for physics when he conducted his first successful experiments in wireless telegraphy.

With the single conspicuous exception of Edison not one of the inventors who have blazed new trails gave to the world devices that could be marketed at once. Development was necessary—development by less ...

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The Truth About JOHN STEINBECK and the MIGRANTS

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THE POET OF THE PEOPLE

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